

## CLAIMS

1. A curable composition comprising:

(A) a vinyl polymer (I) comprising, at the molecular terminal, at least one group represented by the general formula (1):



wherein  $\text{R}^a$  represents a hydrogen atom or a monovalent organic group having 1 to 20 carbon atoms, and

(B) a monoacrylate phenolic antioxidant.

2. The curable composition according to claim 1, wherein the vinyl polymer (I) has a molecular weight distribution of less than 1.8.

3. The curable composition according to claims 1 or 2, wherein the vinyl polymer (I) has a main chain produced by polymerization using, as a main component, at least one monomer selected from the group consisting of a (meth)acrylic monomer, an acrylonitrile monomer, an aromatic vinyl monomer, a fluorine-containing vinyl monomer and a silicon-containing vinyl monomer.

4. The curable composition according to any one of claims 1 to 3, wherein the vinyl polymer (I) is a poly(meth)acrylate.

5. The curable composition according to any one of claims 1 to 4, wherein the vinyl polymer (I) is a polyacrylate.

6. The curable composition according to any one of claims 1 to 5, wherein the vinyl polymer (I) is an acrylic ester polymer.

7. The curable composition according to any one of claims 1 to 6, wherein the vinyl polymer (I) has a main chain produced by living radical polymerization.

8. The curable composition according to claim 7, wherein the living radical polymerization is atom transfer radical polymerization.

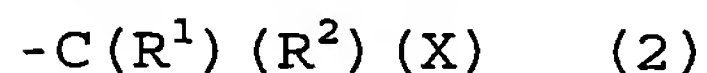
9. The curable composition according to claim 8, wherein the atom transfer radical polymerization uses, as a catalyst, a transition metal complex having an element from the 7th, 8th, 9th, 10th, or 11th group of the periodic table as a central metal.

10. The curable composition according to claim 9, wherein the metal complex used as a catalyst is a complex of a metal selected from the group consisting of copper, nickel, ruthenium and iron.

11. The curable composition according to claim 10, wherein the metal complex used as a catalyst is a copper complex.

12. The curable composition according to any one of claims 1 to 11, wherein the component (A) is a vinyl polymer obtained by the steps of:

(1) polymerizing a vinyl monomer by atom transfer radical polymerization to produce a vinyl polymer having a terminal structure represented by the general formula (2):



wherein  $R^1$  and  $R^2$  represent a group bonded to an ethylenically unsaturated group of the vinyl monomer, and X represents chlorine, bromine or iodine; and

(2) converting a terminal halogen of the polymer into a group represented by the general formula (1).

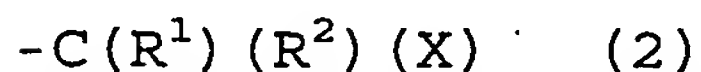
13. The curable composition according to any one of claims 1 to 12, wherein the component (A) is produced by the following step of:

reacting a vinyl polymer having a halogen group at the terminal with a compound represented by the general formula (3):



wherein  $R^a$  represents a hydrogen atom or a monovalent organic group having 1 to 20 carbon atoms, and  $M^+$  represents an alkali metal ion or quaternary ammonium ion.

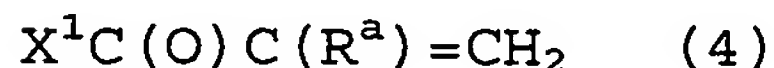
14. The curable composition according to claim 13, wherein the vinyl polymer having a halogen group at the terminal has a terminal structure represented by the general formula (2):



wherein  $R^1$  and  $R^2$  represent a group bonded to an ethylenically unsaturated group of the vinyl monomer, and X represents chlorine, bromine or iodine.

15. The curable composition according to any one of claims 1 to 12, wherein the component (A) is produced by the step of:

reacting a vinyl polymer having a hydroxyl group at the terminal with a compound represented by the general formula (4):

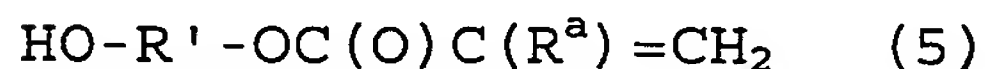


wherein  $R^a$  represents a hydrogen atom or a monovalent organic group having 1 to 20 carbon atoms, and  $X^1$  represents chlorine, bromine or a hydroxyl group.

16. The curable composition according to any one of claims 1 to 12, wherein the component (A) is produced by the steps of:

(1) reacting a vinyl polymer having a hydroxyl group at the terminal with a diisocyanate compound; and

(2) reacting the remaining isocyanate group with a compound represented by the general formula (5):



wherein  $\text{R}^{\text{a}}$  represents a hydrogen atom or a monovalent organic group having 1 to 20 carbon atoms, and  $\text{R}'$  represents a divalent organic group having 2 to 20 carbon atoms.

17. The curable composition according to any one of claims 1 to 6, wherein the vinyl polymer (I) has a main chain produced by polymerizing a vinyl monomer using a chain transfer agent.

18. The curable composition according to any one of claims 1 to 17, wherein the vinyl polymer (I) has a number average molecular weight of 3000 or more.

19. The curable composition according to any one of claims 1 to 18, wherein the component (B) monoacrylate phenolic antioxidant is 2-t-butyl-6-(3-t-butyl-2-hydroxy-5-methylbenzyl)-4-methylphenyl acrylate and/or 2,4-di-t-amyl-6-[1-(3,5-di-t-amyl-2-hydroxyphenyl)ethyl]phenyl acrylate.

20. The curable composition according to any one of claims 1 to 19, further comprising (C) a polymerization initiator.

21. The curable composition according to claim 20, wherein the polymerization initiator (C) is a photopolymerization initiator.

22. The curable composition according to claim 21, wherein the photopolymerization initiator is a radical photopolymerization initiator.

23. The curable composition according to claim 20, wherein the polymerization initiator (C) is a thermal polymerization initiator.

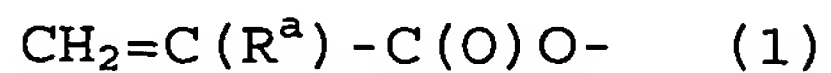
24. The curable composition according to claim 23, wherein the thermal polymerization initiator is selected from the group consisting of an azo initiator, a peroxide, a persulfate, and a redox initiator.

25. A curable composition according to any one of claims 1 to 24, furthermore comprising reinforcing silica as an essential component (D).

26. The curable composition according to any one of claims 1 to 25, comprising from 0.01 to 5.0 parts by weight of the component (B) relative to 100 parts by weight of the component (A).

27. A method for improving mechanical properties of a cured product obtained from a curable composition

comprising a step of adding (B) monoacrylate phenolic antioxidant to (A) a vinyl polymer having, at the molecular terminal, at least one group represented by the general formula (1):



wherein  $\text{R}^a$  represents a hydrogen atom or a monovalent organic group having 1 to 20 carbon atoms, in order to suppress polymerization reaction.

28. A cured product obtained from the curable composition according to any one of claims 1 to 26.